

IN THE CLAIMS:

1. (Currently Amended) An improved vehicle wheel balancer system having a central processing unit and configured with a rotating support structure to support a vehicle wheel assembly during a vehicle wheel balancing procedure, the improvement comprising:

an imaging sensor assembly disposed to acquire at least one optical image of ~~at least a portion of~~ a three-dimensional surface region of the vehicle wheel rim, said optical image consisting of a two dimensional array of pixel elements representing said three-dimensional surface region; and

wherein the central processing unit is configured to receive said acquired optical images from said imaging sensor assembly, and to utilize during a wheel balancing procedure, at least one distance measurement identified from said acquired optical image and which is associated with said imaged portion of said surface region of the vehicle wheel rim.

2 - 6. (Canceled)

7. (Currently Amended) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify a ~~surface~~ profile of the vehicle wheel rim in said imaged surface region.

8. (Cancelled)

9. (Previously Presented) The improved vehicle wheel balancer system of Claim 1 wherein said central processing unit is further configured to utilize said distance

measurement to calculate radial runout about a circumference of a tire bead seat surface of the vehicle wheel rim.

10. (Previously Presented) The improved vehicle wheel balancer system of Claim 1 wherein said central processing unit is further configured to utilize said distance measurement to calculate lateral runout about a circumference of the vehicle wheel rim.

11 - 13. (Cancelled)

14. (Previously Presented) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify a miss-centered mounting of the vehicle wheel rim on a rotating support structure.

15. (Cancelled)

16. (Cancelled)

17. (Previously Presented) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify at least one feature of the vehicle wheel rim, said at least one identified feature selected from a set of features which includes at least a spoke configuration and a spoke profile.

18. (Cancelled)

19. (Currently Amended) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify a wheel rim edge profile in said imaged surface region.

20 - 22. (Cancelled)

23. (Currently Amended) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify the presence of an imbalance correction weight installed on the vehicle wheel rim in said imaged surface region.

24. (Currently Amended) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify the presence of a wheel rim surface defect in said imaged surface region.

25. (Currently Amended) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to select at least one imbalance correction weight placement location on the vehicle wheel rim in said imaged surface region.

26 - 29. (Cancelled)

30. (Previously Presented) The improved vehicle wheel balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to alter a configuration of one or more components of the improved vehicle wheel service system.

31 - 35. (Cancelled)

36. (Previously Presented) An improved wheel parameter measurement apparatus for a dynamic wheel balancer having a spindle shaft for mounting a vehicle wheel assembly consisting of at least a vehicle wheel rim for rotation thereon, the improvement comprising:

an optical energy sensing means for receiving reflected optical energy from an area of the vehicle wheel rim on the spindle, and for generating a two-dimensional image of said detected optical energy, said two-dimensional image composed of a plurality of image pixels; and

a processing means for receiving said images generated by said optical energy sensing means to extract data relating to at least one feature of the wheel rim.

37. (Previously Presented) The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a feature location on the mounted wheel rim.

38. (Previously Presented) The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a feature dimension on the mounted wheel rim.

39. (Previously Presented) The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a configuration of said at least one feature on the mounted wheel rim.

40 - 43. (Cancelled)

44. (Previously Presented) A method for characterizing at least one feature of a vehicle wheel assembly consisting of at least a vehicle wheel rim where the vehicle wheel assembly is mounted for rotational movement about an axis on a vehicle wheel balancer system comprising the steps of:

detecting reflected optical energy from a three-dimensional area of the vehicle wheel rim;

generating a two-dimensional image of said three-dimensional area of the vehicle wheel rim from said detected optical energy, said two-dimensional image composed of a plurality of image pixels;

processing said generated image to extract data associated with at least one feature of the vehicle wheel rim; and

utilizing said extracted data during a wheel imbalance service procedure.

45 – 48. (Cancelled)

49. (Previously Presented) The vehicle wheel balancer system of Claim 1 wherein said imaging sensor assembly is configured to acquire stereoscopic images of said portion of the vehicle wheel rim.

50 – 60. (Cancelled)

61. (Previously Presented) The improved wheel parameter measurement apparatus of Claim 36 wherein said optical energy sensing means is configured to acquire stereoscopic images of said area of the vehicle wheel rim.